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NOTES ON GEOGRAPHIC DISTRIBUTION

First record of Blackfin Goosefish, *Lophius gastrophysus* Miranda Ribeiro, 1915 (Lophiiformes, Lophiidae), from the south-western Gulf of Mexico

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Abstract. We report the presence of Blackfin Goosefish, *Lophius gastrophysus* Miranda Ribeiro, 1915, in Mexican waters of the Gulf of Mexico, expanding its known distribution to the south of the Gulf by approximately 400 km. This report is based in one specimen (712 mm total length, 593 mm standard length, and 7,500 g in weight) captured off the coast of Veracruz. We present the morphometric and meristic data of the specimen and compare it with those previously published.

Key words. Anglerfishes, Mexican waters, new records, range extension, species distribution

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INTRODUCTION

Fish of the family Lophiidae are commonly known as anglerfish or monkfish. Members of the family present the following characteristics: head wide and large; body flattened; jaws wide, with upper jaw protracted; teeth conical, well developed, and inserted in both jaws, pharyngeal bones, and occasionally in the palatine bones; pelvic fins jugular; branchiostegal membranes attached to the isthmus; gill openings positioned behind or below pectoral fins; body naked, with dermal papillae arranged sparsely on the dorsal part and enlarged and equidistant on the edges of the lower jaw; modification of the first dorsal spine into a flap of flesh, the esca (Cervigón 1991; Nelson et al. 2016).

The family currently comprises four genera, *Lophiodes* Goode & Bean, 1896, *Lophiomus* Gill, 1883, *Lophius* Linnaeus, 1758, and *Sladenia* Regan, 1908, and 28 species (Nelson et al. 2016). The genus *Lophius* is represented by seven species (Fricke et al. 2024); of these, American Monkfish, *Lophius americanus* Valenciennes, 1837, and Anglerfish, *Lophius gastrophysus* Miranda Ribeiro, 1915, are distributed in the Western Atlantic, and both are commercially fished along the US coast (Caruso 2002). *Lophius gastrophysus* is widely distributed in the Western Atlantic and shows two disjunctive populations, one belonging to South America and the other occurring from the northern Gulf of Mexico to New York, USA (McEachran and Fechhelm 1998); records of *L. gastrophysus* in Mexican waters are restricted to the northern portion of the Yucatán Shelf (Robertson et al. 2019). Here, we present the first record of *L. gastrophysus* in the southwestern Gulf of Mexico.

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METHODS

A *Lophius gastrophysus* specimen was captured during artisanal fishing targeting the capture of elasmobranchii in the southern Gulf of Mexico. The fishing gear used was a longline with a 1500 m main line carrying 350 number 10 eagle claw hooks operating at a depth of approximately 120 fathoms (220 m). The fish was captured near the town of Barra de Chachalacas, in Úrsulo Galván municipality, Veracruz, Mexico (Figure 1) by the "Río Actopan" cooperative, which comprises 10 small vessels that work along the central coast within marine priority area number 49 (Arriaga et al. 2009).

The fish was identified according to the identification keys and descriptions of Caruso (1983, 2002) and McEachran and Fechhelm (1998). Once collected, the specimen was fixed in 10% formol and preserved in

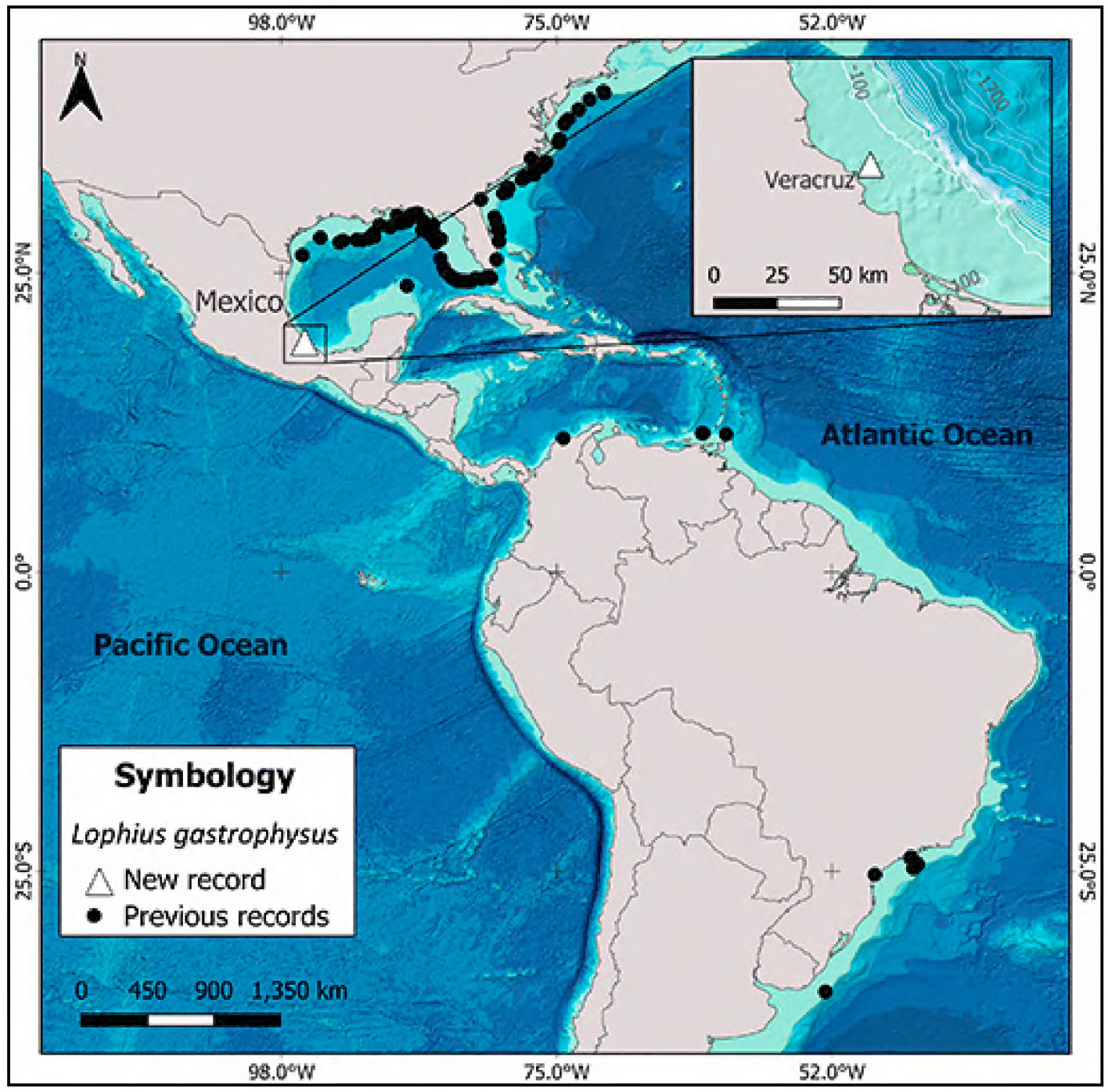

Figure 1. Map of the Gulf of Mexico indicating previous records (dark circles) and the new record (white triangle) of *Lophius gastrophysus* in the Mexican part. Previous records obtained from GBIF 2024.

70% ethyl alcohol. The specimen was deposited in the Ichthyological Collection of the Facultad de Estudios Superiores Iztacala, Universidad Nacional Autónoma de México, with the catalog number CIFI-1965. Morphological measurements were taken on the left side of the specimen with a measuring tape (± 1 mm), both morphometric and meristic data (Table 1) were taking following the modifications established for the group that allow for comparison (Caruso 1981, 1983).

RESULTS

***Lophius gastrophysus* Miranda Ribeiro, 1915**

Figures 1, 2, Table 1

New record. MEXICO – Veracruz • Gulf of Mexico, ca. 41.8 km from Barra de Chachalacas, Úrsulo Galván; 19°14′28″N, 096°04′32″W; 220 m depth; 29.VI.2022; S. Sánchez-Acosta, J. Sánchez-Acosta leg.; longline; 1 spec., CIFI-1965.

Identification. The specimen (standard length 593 mm) was identified by the following combination of characters: radial formulas: D VI,10; A 9; P1 25; P2 I,5, and C 8; gill opening behind pectoral fin, not extend forward; length of third dorsal spine (75 mm) greater than the snout width (46 mm); simple esca; dorsal posterior margin of pectoral fin black; dorsal coloration brown, with dark vermiculation, and ventral coloration grayish, with light brown tones (Figure 2).

DISCUSSION

Caruso (1983) observed two populations of *Lophius gastrophysus*, one restricted to the north and the other to the south in the Western Atlantic, which differ in the length of the illicium. In the southern population, the illicium is 8.8–10.0% of the standard length, although Hearne (2009) reported a value of 18.7% from the southernmost record. In the northern population, the length of the illicium is 10.8–37.4% of standard length (Caruso 1983). However, relative lengths of the illicium should be taken with caution, as the illicium has been known to be regenerated in some specimens (Wilson 1937). Both morphological and genetic

Table 1. Morphometric and meristic data of the *Lophius gastrophysus* specimen captured in the southwestern Gulf of Mexico. Values may be represented as a percentage of the standard length (% SL) or head length (% HL). The range and average values in parentheses as presented in Caruso (1983) are given.

	Southwestern Gulf of Mexico (CIFI-1965)	Caruso (1983) Western Atlantic
Morphometric data (mm)		
Total weight (g)	7500 g	—
Total length	712 mm	—
Standard length	593 mm	—
% SL		
Head length (HL)	30.0	30.3–37.9 (34.0)
First dorsal spine length (illicium)	8.9	8.8–37.4 (18.9)
Second dorsal spine length	23.7	15.1–27.1 (20.6)
Third dorsal spine length	12.6	5.7–16.0 (10.4)
Tail length	35.8	31.7–42.9 (36.2)
Caudal fin length	9.3	—
% HL		
Head width	48.3	48.0–58.9 (52.5)
Head depth	65.7	68.3–78.0 (73.4)
Snout length	54.5	54.2–59.3 (57.1)
Snout width	25.8	20.1–26.8 (23.2)
Distance between internal sphenotic spines	46.1	39.1–48.4 (43.0)
Distance between posterior frontals spines	36.5	30.6–40.5 (35.6)
Distance between left pterotic and the left sphenotic spine	13.5	10.7–15.2 (13.1)
Distance between the left inferior quadrate and anterior palatine spine	66.3	60.7–75.2 (68.5)
Distance between left opercular and subopercular spine	55.6	46.1–57.5 (51.8)
Meristic data		
Dorsal-fin rays	10	9–10
Anal-fin rays	9	8–9
Pectoral-fin rays	25	22–26
Pelvic-fin rays	I,5	—
Caudal-fin rays	8	—

differences should be considered to allow differentiation between *Lophius* species where their geographic distributions overlap (Leslie and Grant 1991).

The lack of deep-sea ichthyofaunal studies and analyses of the seasonal variations of species composition in both off-shore and deep-sea fishing are two of the principal causes for a paucity of information on the composition of the ichthyofauna in the southern Gulf of Mexico. Recent studies in the southern Gulf of Mexico have reported several lophiid species, among them *L. gastrophysus* from the northern Yucatan Shelf at a depth of 599 m (Ramírez et al. 2019). The reported depth coincides with this species' known bathymetric distribution (40–700 m) (Caruso 2002).

Valentim et al. (2007a) mentioned that *L. gastrophysus* is an important resource for deep-water fisheries off the southern and south-eastern coasts of Brazil, and various publications have focused on the biology and ecology of this region for fishing purposes. In the southern Gulf of Mexico, the fishing potential of *L. gastrophysus* must be assessed in greater detail, since a geographical gradient has been observed in the size composition of lophiid species; this gradient may be explained by oceanographic conditions and bottom topography (Ungaro et al. 2002). The route and displacement of spawning migrations which may determine the occurrence of *L. gastrophysus* at various depth strata (Valentim et al. 2007a, 2007b), as suggested for other lophiids (Laurenson et al. 2005). According to Lopes (2005) and Valentim et al. (2007b), this species reaches sexual maturity at 41.7 cm and 37 cm in total length, respectively, and therefore our

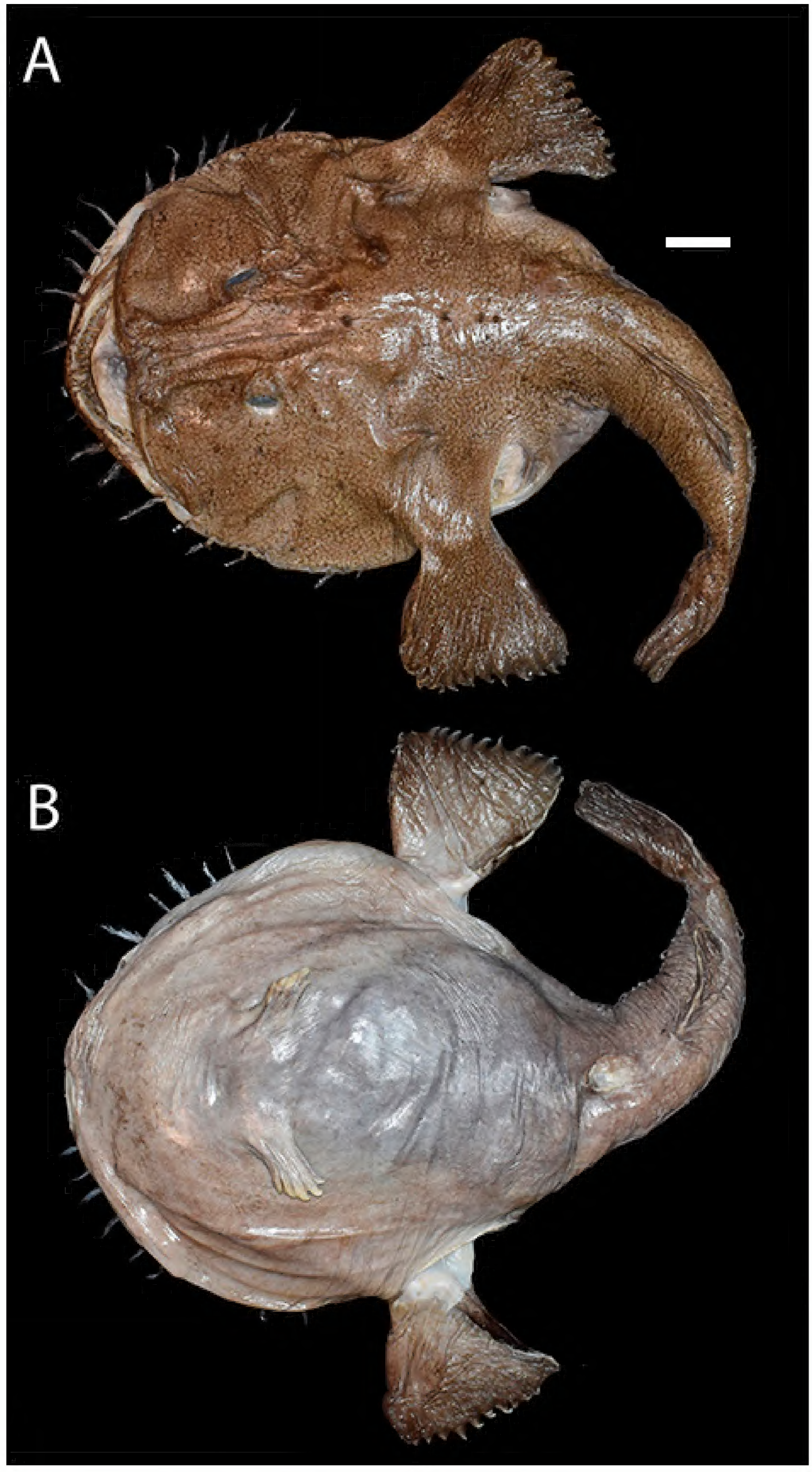

Figure 2. Blackfin Goosefish, *Lophius gastrophysus* specimen (CIFI-1965, 712 mm total length), collected in the south-western Gulf of Mexico. **A.** Dorsal view. **B.** Ventral view. Scale bar = 5 cm.

specimen is mature. *Lophius gastrophysus* spawns in deep water (Valentim et al. 2007b), and our specimen may have approached shallower waters after spawning, where it was captured by artisanal fishermen.

This record of *L. gastrophysus* expands this species' known distribution to the southern Gulf of Mexico by approximately 400 km. It represents the first record of *L. gastrophysus* in Mexican waters of the Gulf of Mexico.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: LFDM-F, OM. Data curation: LFDM-F, AVC-A. Formal analysis: LFDM-F, OM, AAL-A, AVC-A. Funding acquisition: LFDM-F, OM. Investigation: LFDM-F, OM. Methodology: LFDM-F, OM, AAL-A, AVC-A. Resources: LFDM-F, OM. Supervision: LFDM-F. Visualization: LFDM-F, AAL-A, AVC-A. Project administration: LFDM-F. Software: LFDM-F, AAL-A. Validation: LFDM-F, OM, AVC-A. Writing – original draft: LFDM-F, OM. Writing – review and editing: LFDM-F, OM, AAL-A, AVC-A.

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Data availability

All data that support the findings of this study are available in the main text.

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